

Amendment under 37 C.F.R. § 1.111
Application No. 10/658,372

AMENDMENTS TO THE DRAWINGS

Figure 4

Attachment: Replacement Sheet

REMARKS

Claims 1-12, all the claims pending in the application, stand rejected. Claims 1-7, 11 and 12 are objected to. Applicants have amended claims 1 and 3-12, cancelled claim 2 and added new claims 13-21. With respect to the amendments and added claims, the following is the basis for support in the original disclosure:

Amended claim 1 is based at least on the description of original claim 2 page 9, last line through page 10, line 1, page 21, lines 10-15, page 22, line 2 from the bottom through page 23, lines, 5 and page 2, line 7 from the bottom through page 3, line 10 of the specification.

Amended claim 8 is based at least on the description of page 8, line 16-17 and page 10, last line through page 11, line 1 of the specification.

New claim 13 is based at least on the description of page 11, lines 8-10 of the specification.

New claim 14 is based at least on the description of page 4, last line and page 10, lines 4-7 from the bottom of the specification.

New claim 15 is based at least on the description of original claims 2 and 4, page 9, last line through page 10, line 1, page 21, lines 10-15, page 22, line 2 from the bottom through page 23, line 5, and page 2, line 7 from the bottom through page 3, line 10 of the specification.

New claim 16 is based at least on the description of original claim 10.

New claim 17 is based at least on the description of page 5, lines 12-16 of the specification.

New claim 18 is based at least on the description of original claim 3.

New claim 19 is based at least on the description of page 4, last line end page 10, lines 4-7 from the bottom of the specification.

New claim 20 is based at least on the description of original claim 11.

New claim 21 is based at least on the description of original claim 12.

Election/Restriction

Applicants wish to express their extreme gratitude to the Examiner for a fair and balanced reconsideration of the original restriction requirement and the withdrawal of that requirement.

Drawings

The Examiner has objected to the drawings and has requested Fig. 4 to be labeled as "Prior Art." Applicants are submitting herewith a replacement sheet with an amended Fig. 4 that removes this basis for objection.

Specification

The Examiner has objected to the specification for several reasons, all of which are overcome by the present amendment.

The Examiner's objection to the title is overcome by the submission of a new title in accordance with the Examiner's suggestion, which is greatly appreciated.

The Examiner's objection to the Abstract is overcome by the submission of a new Abstract, which is believed to address the Examiner's concerns. If there are additional outstanding issues, the Examiner is invited to contact the undersigned by telephone so that an appropriate resolution of those issues can be achieved.

The Examiner's objection to the specification as having words or phrases that are not perfect grammar is traversed. Applicants have endeavored to correct the errors identified by the Examiner and have reviewed the specification for substantive errors. None were found. However, Applicants stand ready to comply with the Examiner's reasonable requests for additional changes.

Claim Objections

Claims 1-7, 11 and 12 are objected to due to certain language that the Examiner finds confusing. The Examiner's suggestions are greatly appreciated. Appropriate changes to the claims have been made in order to remove each of these bases for objection. If there are

additional outstanding issues, the Examiner is invited to contact the undersigned by telephone so that an appropriate resolution of those issues can be achieved.

Claim Rejections – 35 USC 112

Claims 1-12 are rejected under 35 USC 112, second paragraph, as being indefinite due to the presence of certain phrases that are considered to be ambiguous and the lack of antecedent basis. The claims have been amended in a manner that is believed to remove each basis for rejection. If there are additional outstanding issues, the Examiner is invited to contact the undersigned by telephone so that an appropriate resolution of those issues can be achieved.

Claim Rejections – 35 USC 103

Claims 1, 2 and 6 are rejected as being unpatentable over Mirkanimi et al (2001/0019803) or Mirkanimi et al (6,319,635) in view of Nguyen et al (6,048,652) or Levinson et al (Principles of Lithography) or Barbee et al (6,396,900). This rejection is traversed for at least the following reasons.

Claims 3-4, 6-9, 11 and 12 are rejected as being unpatentable over Mirkanimi et al (2001/0019803) or Mirkanimi et al (6,319,635) in view of Nguyen et al (6,048,652) or Levinson et al (Principles of Lithography) or Barbee et al (6,396,900, and further in view of Kumanda (2003/0152845). This rejection is traversed for at least the following reasons.

Claim 5 is rejected as being unpatentable over Mirkanimi et al (2001/0019803) or Mirkanimi et al (6,319,635) in view of Nguyen et al (6,048,652) or Levinson et al (Principles of Lithography) or Barbee et al (6,396,900) and further in view of Mangat et al (6,596,465). This rejection is traversed for at least the following reasons.

Claim 10 is rejected as being unpatentable over Mirkanimi et al (2001/0019803) or Mirkanimi et al (6,319,635) in view of Nguyen et al (6,048,652) or Levinson et al (Principles of Lithography) or Barbee et al (6,396,900, and further in view of Kumanda (2003/0152845) and Mangat et al (6,596,465). . This rejection is traversed for at least the following reasons.

Applicants appreciate the Examiner's detailed analysis of the several references and their combination in applying their teachings against the claims. The claims have been amended in order to distinguish over those references, individually and in combination.

Claim 1

In particular, none of the references cited in the Office Action discloses that "heat treatment of said substrate with the multilayer reflection film is carried out during deposition and/or after deposition of said multilayer reflection film and before a resist film is formed on said absorber layer" and that "the heat treatment causes mixing at an interface between respective layers forming said multilayer reflection film such that decrease in peak reflectance and change in peak wavelength due to differences between peak reflectances of the multilayer reflection film before and after the heat treatment and peak wavelengths of the peak reflectances of the multilayer reflection film before and after the heat treatment do not cause mismatching with reflection mirrors of a pattern transfer apparatus using a reflection mask produced from the reflection mask blank and do not thereby cause variation in size of a pattern formed on a semiconductor substrate by the use of the reflection mask." Claim 1 has been amended to include these limitations.

Claims 2-7 would be patentable for the reasons given with respect to parent claim 1.

Claim 8

None of the references cited in page 10 through page 13, line 9 of the Office Action discloses that the heat treatment is carried out for the multilayer reflection film which is formed on the substrate and which comprises alternate layers of Mo and Si, as set forth in the amended claim 8. Mirkanimi (US 2001/0019803) and Mirkanimi et al (US 6319635) only disclose annealing for buffer layers.

Claims 9-12 would be patentable for the reasons given with respect to parent claim 8.

Claim 15

As to new claim 15, none of the references cited in the Office Action, alone or in combination, discloses (1) a first measuring step for measuring a peak reflectance or the

multilayer reflection film and a peak wavelength of the reflectance of the multilayer reflection film after the multilayer reflection film is formed on the substrate; (a) step for carrying out a heat treatment for said substrate with the multilayer reflection film at a substrate heating temperature of said substrate with the multilayer reflection film which temperature is not lower than 50° and not higher than a baking temperature of a resist film; (3) a second measuring step for measuring a peak reflectance of the multilayer reflection film and a peak wavelength of the reflectance of the multilayer reflection film after the heat treatment is carried out for said substrate with the multilayer reflection film; and (4) a step for checking whether change in peak wavelength and decrease in peak reflectance due to differences between the peak wavelengths and between the peak reflectances measured in the first and the second measuring steps do not cause mismatching with reflection mirrors of a pattern transfer apparatus using a reflection mask produced from the reflection mask blank and do not thereby cause variation in size of a pattern formed on a semiconductor substrate by the use of the reflection mask.

Claims 16-21 would be patentable for the reasons given with respect to parent claim 1.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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